" Adeline Stokes "

Instructions

for Operating the

Burroughs Calculator

Burroughs Adding Machine Company
DETROIT, MICHIGAN

¶ The purpose of this book is to present simple, fundamental methods for operating the Burroughs Calculator

¶ These methods may be learned in a few minutes and with a little practice sufficient skill may be obtained to enable the operator to handle commercial calculations accurately and with a fair degree of speed.

¶ This book is not intended for school use as it does not contain sufficient problems for practice.

¶ An instruction book containing practice problems, written for use in schools and colleges may be obtained from the Burroughs Adding Machine Company at Detroit or through any of its local offices.

The Hand-operated Burroughs Calculator

The Burroughs Calculator is a key-driven, non-listing computing machine that adds, subtracts, multiplies and divides.

It is made in three sizes as follows

Style 5 05 05—Five-column keyboard with accumulating capacity of 9,999.99

Style 5 09 05—Nine-column keyboard with accumulating capacity of 99,999,999.99

Style 5 13 05—Thirteen-column keyboard with accumulating capacity of 999,999,999,999.99

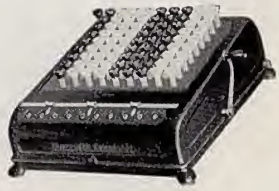
These styles are illustrated below

Any of these sizes may be constructed with keyboards containing whole figures and fractions for the adding and subtracting of amounts, such as feet, inches and eighths of inches, hours and minutes, etc.

The instructions and examples in this book are illustrated with the 9-column machine but many of the problems may be handled with the 5-column size. Also it may be found that for certain work, some problems can be handled more efficiently with the 13-column size.

Style 5 13 05

Style 5 05 05



Style 5 09 05

Burroughs Electric Calculator

The Burroughs Electric Calculator is a key-actuated, non-listing machine essentially the same as the hand-operated Burroughs Calculator except that the depression of a key merely causes an electrical contact and the motor operates the computing mechanism. Thus the electric machine can be operated more easily, rapidly and accurately

The Burroughs Electric Calculator is made in two sizes, as follows

Style 5 09 25—Nine-column keyboard with accumulating capacity of 99,999,999 99, weight only 16 pounds.

Style 5 13 25—Thirteen-column keyboard with accumulating capacity of 999,999,999,999 99, weight only 20 pounds.

The rear of the machine is elevated to a convenient height for easy operation. It has three-point support to give it steadiness even though it may be on an uneven surface. Its light weight makes it easy to carry from desk to desk.

The range of the electrical current to which it should be connected is given on a plate on the back of the machine. Be sure that the voltage and number of cycles are within this range before attaching the plug. The motor consumes current only when the machine is in actual use. It is therefore not necessary to turn off the current when the machine is not in use.

Keyboard Operation

The illustrations in this text are of the hand-operated machine. The instructions, however, apply equally well to the electric machine, except that the electric is cleared by depressing the electric clearing bar instead of using a handle.

Because the registration of the amounts in the dials is accomplished entirely by the motor, short-stroking and other mis-operations of a key are prevented, in other words, a partial registration of a key value in the dials is impossible.

Light, Uniform Key Touch

Since the force necessary to operate the computing mechanism is furnished entirely by the motor, the key touch is very light. The key depression necessary to actuate the motor is unusually short and is exactly the same for all keys. This short key depression and light touch make a greater span of the keyboard possible, thus facilitating the holding of difficult key combinations with one hand. For instance, the 1 key in the third column and the 9 key in the first column can be operated easily and accurately with the thumb and little finger of the right hand when multiplying.

The light, uniform key touch makes possible a rhythm and ease of operation not obtainable on hand-operated machines because on such machines the key depressions vary Operator fatigue is greatly reduced and the speed of calculating is greatly increased.

THE MACHINE

The dials register the results of the calculations.

The pointers are used to indicate the decimal point in the result.

The handle (or the electric clearing bar) at the right of the machine is used for clearing the dials.

The standard full keyboard consists of keys arranged in columns with alternating sections of key tops colored white and black, conforming to the punctuation for dollars and cents. The standard full keyboard permits simple and compound operations and enables the operator to multiply either from right to left or left to right, as may be required.

Each key top has a large and small figure on it. The large figures are used for addition and multiplication, and the small figures are used for subtraction and division. The blank key at the left is used in subtraction.

The key tops for the even numbers are flat and those for the odd numbers are concave to facilitate touch addition.

Position of machine

Correct Position of Machine

The Calculator should be placed on the desk in front and slightly to the right of the operator, and at an angle so that the forearm will be parallel with a line from the one-cent key to the nine-dollar key The correct position of the machine assists the operator to form correct habits of operation.

Holding a pencil

Holding a Pencil

A pencil should be held between the thumb and palm while operating (see illustration). This saves time in writing answers and also has a stabilizing effect on the muscles, thereby giving the operator greater confidence. The arm should be held in a comfortable position slightly above the keyboard.

Clearing the machine

Clearing the Machine

Always clear the machine before beginning a new problem. This is accomplished by a forward pull of the handle—it returns automatically (On the electric machine the clearing bar is depressed to clear the machine.)

ADDITION

Addition is performed by depressing the keys which represent the figures to be added. The large figures on the key tops are used.

The first column at the extreme right of the keyboard is for units, 1 to 9, the second column is for tens, 10 to 90; the third column is for hundreds, 100 to 900, etc.

To add 5, depress the 5 key in the units column.

To add 45, depress the 4 key in the tens column and the 5 key in the units column.

To add 345, depress the 3 key in the hundreds column, the 4 key in the tens column and the 5 key in the units column.

Numbers should be added in the order read, that is, to add 345 depress the 3 key in the hundreds column, first, then the 4 key in the tens column and the 5 key in the units column.

There are no large ciphers on the key tops because ciphers are automatically registered on the dials when adding and multiplying.

To add 50, depress the 5 key in the tens column.

To add 500, depress the 5 key in the hundreds column.

To add 105, depress the 1 key in the hundreds column and the 5 key in the units column.

To add 1005, depress the 1 key in the thousands column and the 5 key in the units column.

Full Keyboard Method

The full keyboard method is so-called because all the keys from one to nine are used. This method may be used when a limited amount of adding is to be done by an untrained operator

A shorter method is to use combinations for all figures above five; for instance, strike 3 twice for 6, 4 twice for 8, 4 and 3 for 7, and 5 and 4 for 9. It is faster to operate the higher key first in adding combinations for 7 and 9.

Touch Method of Addition

The touch method is recommended when the operator will use the machine a great deal for adding. This method is similar to the shorter method described above, but the keys are located by the sense of touch as in typing, instead of by sight. Only the first two fingers of the right hand are used. To facilitate touch operation, the key tops for the even numbers are flat and those for the odd numbers are concave. With a little practice the ability to locate the proper keys becomes a habit and may be relied upon for correct operation. Likewise, combination strokes become a habit and require no conscious effort.

Accuracy

Since the items added are not listed by the machine, care must be taken to operate the right keys, as errors necessitate re-adding.

Sub-totals—When long columns of figures are added, sub-totals should be noted on paper after every twenty-five or fifty items to facilitate checking. Errors of transposition, operating the wrong key, and operating a key the wrong number of times, may be found more readily when the work has been handled in sections, because usually it is not necessary to re-add all sections.

Fumbling—Fumbling results from forcing speed before key location has been

learned thoroughly Great care should be used in the beginning to avoid the forming of incorrect habits.

Rhythmic Action—In performing addition the movements of the hand and forearm should be timed to insure smooth, regular action—not too fast nor too slow

Rhythmic action is just as essential in learning to operate the Calculator as it is in learning to play a musical instrument.

The proper speed for beginners is from two to two and one-half key strokes per second.

A few practice problems are given to illustrate the simplicity of the touch method and rhythmic movement. Do not look at the keyboard while adding.

34	21	45	33	34	55	54	21	22	45
43	11	43	34	44	45	45	12	21	43
34	12	33	54	54	5	54	32	23	23
54	32	43	34	55	50	43	34	43	22
50	34	23	32	54	54	45	44	34	21

215 Complete instructions for learning touch addition may be obtained at any Burroughs Agency or Burroughs School for Operators.

Adding Sales Checks or Similar Media

Adding of sales checks differs from adding columns of figures, only in that a slip must be handled for each amount. The operation of turning the checks is performed with the left hand and requires practice to become skillful.

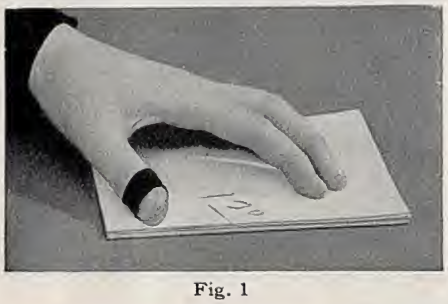


Fig. 1

Fig. 2

Fig. 3

Cash Sales checks are first proved by cashiers. They are then sorted so that totals may be obtained by clerks and departments. Charge Sales checks are sorted into similar groups, but they are usually handled at a separate operation.

The proper way to turn sales checks is to place a bundle of checks at the left of the Calculator, and hold them firmly with the fingers of the left hand as shown in Figure 1

The fingers hold the checks, and the thumb raises them. This is accomplished by pressing the thumb against the check near the corner, and drawing it toward the palm of the hand. See Figure 2

As the check buckles, it is caught by the first finger, and held while the amount on the next check is read as shown in Figure 3

After a number of checks have been added, they should be placed face down in a separate pile. The sub-total may be written on the back of the last check in the pile. This enables the operator to prove more readily as errors can be localized to batches.

A rubber band used on the thumb as shown in the accompanying illustrations is essential to the rapid handling of the checks.

Illegible figures are the cause of many errors in adding sales checks. The operator should use extreme care in reading figures.

MULTIPLICATION

Simple Multiplication

From the right to the left of the machine

Machine multiplication is repeated addition. The large figures on the key tops are used.

To multiply on the Calculator, the keys representing the amount to be multi plied are operated the number of times indicated by the figures in the multiplier.

Simple multiplication is always performed by beginning at the right of the keyboard. This is illustrated by the following example

Example Multiply 45 by 3

Operation Place one finger of the right hand on the five key in the first column at the right of the keyboard and one finger of the left hand on the four key in the second column. Hold the arms and hands as shown in the picture and depress the keys three times.

Two hand operation

The dials will show the product of 45 × 3, or 135.

NOTE: The action in multiplying should be largely a rhythmical wrist movement.

When multiplying, the key factor (amount held) is depressed the number of times indicated by the figures in the other factor, beginning at the right of the keyboard. No operation is required for a cipher in the multiplying factor and the key factor is moved one place to the left for each such cipher

To multiply 45 by 30, place the fingers on the 4 and 5 keys as before, holding the 5 key in the second column and the 4 in the third column, operate three times. Answer 1350

To multiply 45 by 33, multiply first by three as explained above, then move the fingers one column to the left and operate three times. Answer 1485.

Correct Fingering

In operating the keys, the fingers should be held in a curved position, and should be raised slightly above the keys after each depression. The wrists should move freely in operating.

After placing the fingers on the keys according to the rules on the following pages for holding figure combinations, a speed of from three to five keystrokes per second should be maintained and the rhythm should not be broken in moving from column to column.

Holding Key Combinations

The following rules for holding key factors of more than two figures are given to facilitate the operation in multiplying and dividing.

Natural combinations

The accompanying illustrations show efficient methods of holding key combinations and should enable the operator to select the proper combination at sight.

Natural Combinations—When the hands and arms are held in a normal position it will be seen that combinations such as 45 or 57 or any other two-figure numbers where the first key from the right is the higher, may be held more easily by the two fingers of the right hand.

Such combinations are classified as "Natural" because of the ease with which they may be held.

In a natural left-hand combination the first figure from the right will be the smaller as 75, 54, or similar combinations.

The number 7557 held as shown in the above picture is a natural left- and right-hand combination.

Reverse combinations

Reverse Combinations—By referring to the accompanying illustration it will be seen that in holding 5775 the higher keys are held by the longer fingers. This necessitates the turning of the hands outward and raising the elbows slightly Such combinations are classified as "reverse."

Multiplications requiring the holding of reverse combinations should be practiced until no difficulty in operating is experienced.

Raising the elbows slightly will greatly assist in the holding of reverse combinations. Hold the fingers in a curved position and relax the muscles of the forearm after each key stroke.

If the correct method of operating is applied in the beginning, the operator will soon acquire an easy, graceful style of operation that will lighten the day's work.

A good practice problem to obtain correct rhythmical action is to multiply

45 by 9 across the entire keyboard, beginning at the right. Hold 45 in columns one and two, using the first finger of each hand, and operate nine times; move the fingers to columns two and three and operate nine times. Continue across the keyboard and try to move over each time without a break in the rhythmical action.

Interpolation—The holding of many combinations may be simplified by interlacing the fingers.

This is shown in the accompanying picture which illustrates the interpolation method of holding keys.

Interpolation

In holding 375 the 7 is held by the left hand and 3 and 5 are held by the right hand.

No attempt should be made to connect the hands by allowing them to touch or by locking the fingers, as such practice impairs the skill of the operator.

After a few minutes' practice in operating and moving from column to column without breaking the rhythm, the operator will establish perfect confidence.

It is natural for the hands to move in unison when performing the same operation.

In multiplying, relax the muscles of the arm after each stroke, lifting the fingers slightly above the key tops.

Cross hand operation

Cross Hand Combinations—It frequently occurs that reverse combinations may be eliminated by placing the hands in reverse order as shown in the picture illustrating "Cross hand operation."

By crossing the hands, reverse left and right combinations become natural combinations. This frequently simplifies the operation.

Selection of Key Factors—Operations may frequently be simplified by selecting for the key factors the amounts which permit the combinations that are the easiest held.

Instead of holding the key factor requiring the fewest number of strokes, it is sometimes better to select the factor that offers greater security in operating.

NOTE: Long finger nails are the greatest cause of fumbling in multiplying. The nails should be trimmed close to avoid their coming in contact with the key tops.

Holding Factors Ending in Ciphers

When a key factor ends in a cipher no key is held in the first right-hand column of the machine.

A cipher at the right

Example 450 × 134

Operation Hold 45 in the second and third columns and multiply to the left.

When ciphers occur at the right in both factors, hold the key factor one place to the left for each such cipher

Multiplication of Decimals

Multiplication of decimals is accomplished in the same manner as the multiplication of whole numbers. The required number of places may be pointed off either before or after multiplying. The pointers on the machine are used to indicate the decimal point in the result.

Rule for pointing off in multiplication of decimals

Point off as many places from the right of the machine as there are decimal places in both factors.

Example 6.25 × 3.75 = 23.4375

Proving Simple Multiplications

After obtaining the product of two factors, multiply them in reverse order, i. e., use the other factor as the key factor This will detect errors due to mental transposition of figures or mechanical mis-operation of the machine, such as operating the wrong keys or operating them the wrong number of times.

Multiplying from the Left to the Right of the Machine

When the product of two factors containing decimals will exceed the capacity of the machine, such a multiplication may usually be performed without affecting the commercial value of the answer, if the multiplication is made from the left to the right of the keyboard. In such cases it is necessary to run off the right side of the keyboard with the key factor, dropping first one figure and then another until all figures in the multiplying factor have been used.

Example Multiply 32.465 × 5.1542368

Operation Hold 32.465 with the 3 in the left column on the machine and multiply by 5, 1, 5, 4 and 2 At this point 5 in the key factor will have reached the right-hand column of the machine. In moving to the right to multiply by 3, the finger holding the 5 will "drop off" the keyboard.

In the next move one more figure is dropped.

In the last operation the third figure will be dropped.

The last operation then consists of multiplying 32 × 8. Answer 167.3322968.

When one or more figures in the key factor are dropped in running off the keyboard, the accuracy of the product may be affected two places from the right of the machine.

Pointing Off from the Left of the Machine

When multiplying from left to right

Whole Numbers—Point off as many places from the left of the machine as there are whole figures in both factors.

The dials at the left

NOTE: In pointing off, the dial at the extreme left of the machine must always be included.

Example 37 5 × 2 54. The dials will show 0952500000

The point will fall between the 5 and 2 as shown in the picture. Answer 95.25

Decimal Fractions—If there are no whole figures in either number, such as 256 × .382, the point will be at the extreme left of the machine. The dials will show 0977920000 which when pointed off gives an answer of .097792

When decimal factors contain preceding ciphers, as .0036, the point is moved to the left one place for each preceding cipher in both factors.

Preceding ciphers are used only in pointing off They are then disregarded and only the figures of value in the key factor are held, starting at the extreme left of the machine.

In the problem, .0036 × .048, the point must be moved three places to the left. As the starting place in pointing off is the extreme left of the machine, three ciphers must be prefixed in the answer, as .0001728.

In the problem, 45.065 × .00059, the point should be moved two places to the right for the whole figures and three places to the left for the preceding ciphers. This would require one cipher to be prefixed in pointing off the product, as .02658835.

Multiplication of Common Fractions

When fractional amounts expressed in the form of common fractions are to be multiplied, it is necessary to change them to their decimal equivalents to conform to the decimal plan of the machine.

Example

$3\frac{1}{4} \times 6\frac{5}{8}$

$3\frac{1}{4} = 3.25$
$6\frac{5}{8} = 6.625$

The machine operation then becomes 3.25 × 6.625, pointing off as many places as there are decimals in both factors. Result 21 53125

The decimal equivalent of common fractions most frequently used are shown on the next page and should be committed to memory

Decimal Equivalents of Common Fractions

3rds	6ths	12ths	Decimal Equivalent
		1	.08334*
	1	2	16667*
		3	.25
1	2	4	.33334*
		5	.41667*
	3	6	.5
		7	.58334*
2	4	8	.66667*
		9	75
	5	10	.83334*
		11	.91667*

4ths	8ths	16ths	Decimal Equivalent
		1	.0625
	1	2	.125
		3	.1875
1	2	4	.25
		5	.3125
	3	6	.375
		7	.4375
2	4	8	.5
		9	.5625
	5	10	.625
		11	.6875
3	6	12	75
		13	.8125
	7	14	.875
		15	.9375

* All decimal equivalents on this card ending in 4 or 7 will give accurate results when multiplied by amounts less than $100.00. All other decimal equivalents are complete and will give accurate results when multiplied by any amount.

For amounts less than $10.00, only four digits of the decimal equivalent need be used. However, when the entire decimal equivalent shown in the table is not used, add 1 to the last digit used; for instance, use .3334 for 1/3.

NOTE: See page 23 for rule for finding the decimal equivalents of common fractions.

Split Multiplication

In multiplying large amounts, the key factor may be split for convenience. After multiplying through with part of the figures those left may be multiplied in the same manner In this way difficult combinations may be avoided. It is good practice to first multiply the first three figures at the right of an amount and finish with the remainder.

To multiply 42935 × 39234, hold 935 (omitting the 42, which would fall in the fourth and fifth columns). Multiply by 39234, then hold 42 starting in the fourth and fifth columns and multiply by 39234. This completes the operation and the answer is 1684511790

Accumulation of Results

When it is desired to obtain the total of a number of two-factor extensions, this may be accomplished by allowing the several products to accumulate as the extensions are made by simple multiplication.

The Fixed Decimal Point Method of multiplying must be used in accumulating the products of fractional amounts. This is explained later

Stroke Wheel Multiplication

Stroke Wheel Multiplication is a method of multiplying an amount that is already on the dials by another amount and is usually used because it is quicker than clearing the machine and performing a simple multiplication.

When one factor is on the dials, the correct multiplier is always one less than the other factor because one stroke of the multiplying operation is taken when the factor is placed on the dials. In other words, the dial factor is already multiplied by one.

This is known as the Stroke Wheel Method because the dials show the correct number of strokes to be taken in each column. The operation must be performed from left to right in order that the figures on the dials may be followed as the multiplying progresses.

Over the left figure

Example Multiply 18.75 × 35

The key factor is 35

The dial factor is 18.75

Operation Place 18.75 on the dials at the right. Hold 34 (one less than 35), as shown in the picture, with the right figure of the key factor over the left figure on the dials.

Operate once as indicated by the left figure on the dials. Move one place to the right and operate eight times to agree with the next figure in the dial factor, move one more place and operate seven times, move one more place to the right and operate five times. Answer. $656.25

This method may be employed when amounts are being called by another person as it prevents forgetting. It also saves the time of writing the result of the first multiplication when this result is to be multiplied by another factor

Example· 35 bolts, 53 yards each, @ $2.35 a yard.

Operation. Multiply 35 × 53 by simple multiplication as soon as the amounts are called. The amount on the dials will be 1855 yards. Leave this amount on the dials and multiply by 235 by the Stroke Wheel Method. Answer $4,359 25.

Stroke Wheel Multiplication when the Key Factor Ends in One

A simple rule for holding amounts as key factors which end in one is to first place the fingers on the keys that represent the exact amount with the one in the same column as the left figure on the dials. Since a cipher will occur at the right, if one less is held, raise the finger from the one key and operate the other keys to agree with the left figure on the dials.

NOTE: The Stroke Wheel does not move when the key factor ends in one.

Pointing Off for Decimals

Point off as many places from the right of the machine as there are decimal places in the factors.

Example 7 23 × .365 × 54.7 = 144350565. After pointing off six places from the right, the answer is 144.350565.

Fixed Decimal Point

The use of the Fixed Decimal Point method of multiplying eliminates the necessity of pointing off after multiplying fractional amounts.

It also permits the accumulation of whole and fractional amounts in checking invoices.

For convenience in operating, place a decimal pointer between the fifth and sixth columns to be used as a fixed decimal point between the black and white keys.

Unit position

The columns at the left of the split may be used for dollars and those at the right for cents and fractions of cents.

First, hold the unit price in the correct relation to the fixed decimal point. If the value of one article is $3.25, hold 3 in the first column to the left of the split, 2 in the first column to the right and the 5 in the second column to the right of the split. The first depression of the keys will then record the unit value properly pointed off See illustration.

Example: Find the value of 25 things at $3.25 each.

Operation Hold the unit value ($3.25) in the correct relation to the fixed decimal point, as explained above, and operate five times, move one place to the left and operate two times.

Answer $81.25

NOTE: The answer is pointed off automatically

To locate the correct starting point when the multiplier consists of whole numbers and fractions, place the fingers on the price in the unit position and then move one place to the left for tens, two places for hundreds, etc. Multiply from left to right.

When large fractional amounts are to be multiplied one or more fingers will be dropped off the keyboard in moving to the right to complete the multiplication.

The dropping of figures from the key factor may affect the accuracy of the answer two places from the right of the machine.

When the quantity (multiplier) is fractional, move to the right to locate the correct starting place.

To find the value of one half pound at 48 cents per pound, multiply by 5 as follows: Place the fingers on 48 in the unit position, then move one place to the right and depress the keys five times. Answer 24 cents.

Problems for practice· (Always hold the price as the key factor)

5 Yards @ $0 75	3½ Yards @ $0.54	752 Yards @ $0 77¼
25 Yards @ 2.50	125½ Yards @ 58	2512 Yards @ 27½

NOTE: When either factor contains a fraction, it is good practice to add five mills before reading the result. This increases fractions of one-half cent or more to a full cent.

Fixed Decimal Point Accumulation

When several items are extended without clearing the machine, their sum is automatically accumulated. This is the shortest method of checking invoices.

Extend the following invoices and check by accumulation

5	Pieces @	$ 1.35	each	$ 6.75
25	Pieces @	75	each	.....
5½ (5 5)	Pieces @	.48	each	.....
7¼ (7 25)	Pieces @	20.00	each	.....
24½ (24.5)	Pieces @	2.06	each	.....
106	Pieces @	.075	each	.....
				$231 56

When fractions are dropped in the individual extensions, the proof by accumulation will differ accordingly

Articles Priced by the 100, 1000 and Hundredweight

The multiplication of articles priced by 100, 1000 and hundredweight should be made over the fixed decimal point to save time in pointing off.

Example 275 castings at $6.24 per 100. It will be seen that there are two whole hundreds and that 75 is a fraction of 100.

Operation. Hold the price in the unit position and multiply by 2, the number of hundreds, then move to the right and multiply by 75 the fractional portion of the quantity Answer $17.16

Hundredweight and thousands are handled in the same manner.

Problems for practice:

1741 Pcs. @ $14.50 per C	1355 Lbs @ $15.50 per CWT
7986 Lbs @ 9 50 per M	5625 Lbs @ 67.50 per M

Creameries and Dairies

Cream is purchased on the basis of the amount of butter fat it contains. The per cent of butter fat is referred to as "test." The value may be found by multiplying the price by the test per cent over the fixed decimal point, which will automatically point off the product of the two fractional amounts. Complete the operation by multiplying by the third factor which is pounds (a whole number)

Pounds Cream	Test	Price per lb.	Pounds Cream	Test	Price per lb.
19	.31	@ $0.61	23	.33	@ $0.58
10	.38	@ 59	41	.35	@ .52
29	.33	@ .63	53	.40	@ 53

NOTE: Three or more fractional amounts should be multiplied by the Stroke Wheel Method.

SUBTRACTION

Subtraction is accomplished by adding the complement of the amount to be subtracted. The complement of an amount is the difference between that amount and one unit of the next higher order

Example· The complement of 75 is found as follows

100 (One unit of the next higher order)
75 (Amount to be subtracted)
25 (Complement of 75)

The small figures on the key tops of the Calculator eliminate the necessity for mentally computing the complement.

To Subtract

Use the small figures for the amount being subtracted.

Depress the keys that represent the amount to be subtracted, less one, which is deducted from the first right-hand figure of value, also depress all the cipher keys to the left of the columns used for the amount being subtracted. The cipher keys at the left should be depressed simultaneously with the first figure in the amount being subtracted. Depress several cipher keys at a time. See illustration.

Operating cipher keys

Examples

365 (Use large figures)	605 (Use large figures)	3842 (Use large figures)
75 (Use small 74)	335 (Use small 334)	302 (Use small 301)
290	270	3540

When the figure nine occurs in the amount being subtracted, no key is operated in that column except when the first right-hand figure of value is a nine. In the latter case, one is deducted as explained above so the nine becomes an eight.

Nines which are not to be operated, are indicated in the following example problems by the letter x.

When a cipher occurs at the right in the amount being subtracted, no key is operated in that column.

NOTE: There are no small nines on the Calculator keyboard.

Examples

729 (Use large figures)	5500 (Use large figures)	21395 (Use large figures)
595 (Use small 5x4)	260 (Use small 25x)	4079 (Use small 4078)
134	5240	17316

In subtracting it will be noted that one unit is carried into the dial at the left. The depressing of the cipher keys eliminates the one which should be carried entirely out of the machine.

Subtracting in Split Keyboard Work

It is occasionally necessary to subtract across a "split" when two or more columns have been added in different sections of the keyboard at the same time.

Example: (The split should be between a black and a white column.)

Hours	Minutes	
26	15	The dials show 109 hours and 75 minutes.
32	45	A deduction of 15 minutes is to be made.
51	15	
109	75	Subtract 15 from 75 following the rule

previously explained. It will be seen that the 109 hours remain unchanged. Subtractions may be made from amounts at the left of the split in the same manner.

Credit Balances

In adding and subtracting charges and credits, or other amounts, alternately, the machine will automatically show nines in all the dials at the left when the total of subtracted amounts is greater than the added amounts.

A negative total

The true complementary method of subtraction is used on the Calculator because only one rule of operation is involved—that of adding the complement. This method eliminates the confusion that is likely to result where a number of rules must be memorized, and it enables the operator to perform additions and subtractions alternately without regard to their order

In the following problems, the minus sign marks credit (subtracted) items:

28	The example at the left will produce 999999968 on the dials, as
72–	shown in the above picture. This is called a negative total and indi-
36	cates a credit balance. To find the true credit, the negative total
24–	must be converted. This is accomplished as follows· Hold small 67
999999968	(one less than 68) in the columns directly over the dials in which the number is shown and operate twice. The first operation will clear the machine and the second operation will show the true credit, 32

When the dials show a negative total at an intermediate point in the operation, complete the work before converting to the true credit as the final result may show a debit balance (plus amount)

75	23	.41	.12	94–
.89–	.42	.98–	.24–	.63
.44	75–	.84	.75	72
.98–	28–	22–	.63–	.23–
28–	.37	.25	.45–	.77
96 Cr	.01 Cr	.30	.45 Cr	95

DIVISION

The dividend

Just as machine multiplication is repeated addition so is machine division repeated subtraction. The quotient, or answer, is a record of the number of subtractions.

Like the mental method, machine division is performed from left to right. The dividend is entered at the extreme left of the keyboard and the divisor is held at the left side of the keyboard, as illustrated.

The following problem illustrates the fundamental principles of repeated subtraction in division.

Example 36 ÷ 12

Quotient 1, remainder 24

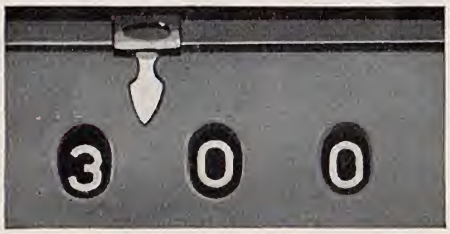
Operation Place 36 in the machine, beginning in the first column at the left. Set a decimal pointer at the right of this amount and point off by moving it one place to the left for each whole figure in the divisor.

Hold small 11 (one less than 12) in the two left-hand columns, and since it is seen that 12 is contained in 36, operate the keys once.

In ordinary subtraction the 1 which appears in the dials to the left is carried out of the machine by depression of the small cipher keys at the top of the keyboard. In division, however, this one is a record of the number of subtractions and is left in the machine as a quotient. After this first subtraction the dials show the quotient figure 1 with a remainder of 24.

Quotient 2, remainder 12

Since 12 can be subtracted from the remainder, operate the divisor keys again. The quotient now is 2 with a remainder of 12



Answer—Quotient 3

Since 12 can still be subtracted from the remainder, operate the keys once more. The dials show the quotient 3 with no remainder.

When the divisor is not contained in an equal number of figures in the dividend, it must be moved one column to the right to add another dividend figure.

The first dial at the left of the columns in which the subtraction is being made is the stroke wheel. This dial then serves two purposes. It is a dividend dial and also registers a quotient figure.

Divisor not contained in 34

As the dividend is reduced in dividing, the quotient increases, therefore, at some point in the operation the figure on the quotient dial becomes the true quotient.

This occurs when the number of key strokes equals the number on the stroke wheel.

Example· 3465 ÷ 45

Operation. Add 3465 in the machine at the left.

Always point off before dividing.

Place a decimal pointer in the same place as the point occurs in the dividend, then point off as follows

When the divisor contains whole numbers with or without decimals, move the pointer one place to the left for each whole figure in the divisor.

Stroke wheel 3

In the example 3465 ÷ 45, there are two whole figures in the divisor Therefore, the point will be moved two places to the left.

Place the fingers on the small 44 (one less than 45) in the first two columns from the left as shown in the upper illustration.

Since 45 cannot be subtracted from 34, the divisor must be moved one column to the right to add another dividend figure, which will place the divisor in the same columns as 46 on the dials. See lower illustration.

Stroke wheel 5

The stroke wheel reads 3. Operate the divisor keys three times and count the number of strokes as 1, 2, 3.

NOTE: The initial number of strokes indicated by the stroke wheel should always be made rapidly without looking at the dials.

The stroke wheel has changed to 5, having advanced two units.

Remainder

Operate two more times and continue to count 4, 5. The stroke wheel has moved one unit, therefore, operate once more counting 6.

The quotient dial shows 6. The stroke wheel has been equaled and is now disregarded.

The next step in the operation is to reduce the remainder, 76.

NOTE: A remainder is the amount on the dials in the columns in which the divisor is being held, either after equaling the stroke wheel, or as a final result upon the completion of the problem.

Move over

Remainders must always be reduced until they are smaller than the divisor In the problem illustrated, the remainder at this point, after equaling the stroke wheel, is 76. Therefore operate the divisor keys once more to reduce the remainder

The remainder is now 31 and since it is less than the divisor, 45, it is necessary to move the divisor one place to the right to add another dividend figure.

Stroke wheel is 3

Remainder

The new stroke wheel is 3 Operate three times counting the strokes 1, 2, 3. The wheel has advanced to 4. Operate one more time. The wheel has advanced to 5. Operate once more, counting the stroke as before.

The stroke wheel remains the same and consequently it has been equaled.

The next step is to reduce the remainder, 90, which will require two more key strokes. The answer is 77.

Answer

There are three principal steps in dividing that always occur in cycles—

First —Equal the stroke wheel

Second—Reduce the Remainder

Third —Move over to add another dividend figure

These operations soon become a habit and make machine division simple and exceedingly rapid.

Ciphers at Right of Divisor

Ciphers at the right of a divisor are considered only in pointing off, i. e., in dividing by 360, the point is moved three places to the left. The key factor is 35, the small figures less one being used.

Nines in the Divisor

Intermediate Nines—When intermediate nines occur in the key factor in Subtraction and Division, they are disregarded and no key is operated in that column. There are no small nines on the Calculator keyboard.

Nines at the Left—When the left of the divisor consists of one or more nines, the stroke wheel will be one column to the left of the column or columns in which the nines occur, even though they are not held on the keys.

When The Stroke Wheel Shows a Cipher

When the dial at the left of the columns in which the divisor is held shows a cipher, reduce the remainder, move over and continue to divide.

When the divisor is not contained in the partial dividend after moving over, it is necessary to move again or until the amount on the dials will contain the divisor

Running off the Keyboard

When the right-hand limit of the keyboard is reached in dividing, the operation may be continued by dropping figures from the key factor in moving over

When one or more figures have been dropped in this manner, the accuracy of the quotient may be affected three places from the right.

NOTE: When fractional quotients are incomplete, one unit should be added to the last quotient figure at the right if the remainder is equal to or greater than five-tenths.

Pointing Off in Division

Pointing Off Correctly is Very Important—It is simple, if done before dividing, but is the greatest cause of errors when neglected. Do not guess. Point off before dividing and always follow the rule no matter how strange the quotient may appear

Whole Numbers—Move the pointer one place to the left of the decimal point in the dividend for each whole figure in the divisor.

Example. For a divisor such as 25. or 25.05 move two places to the left.

Preceding Ciphers Ciphers in fractional amounts, located between the decimal point and the first figure of value are called preceding ciphers.

Move the pointer one place to the right for each preceding cipher in the divisor

Example· For .0035 move two places to the right.

NOTE: When the divisor contains neither whole numbers nor preceding ciphers, the point is not moved i. e., do not move the pointer for divisors such as .375.

Problems for Practice

54.5622 ÷ 15.4	92.3394 ÷ 948.	16.90834 ÷ .000398
83363 ÷ 7.39	14.1856 ÷ .00416	4.0055 ÷ 290.

Prove division by multiplying the divisor by the quotient, and adding the remainder, if any

Reciprocals for Use in Division

By the use of reciprocals, problems in division may be solved by multiplication.

Instead of dividing by a number, the same result can be obtained by multiplying by its reciprocal.

The reciprocal of a number is one divided by that number For example, the reciprocal of 2 is .5, i. e., 1 divided by 2 equals .5 The reciprocal of 4 is 25

Example Divide 36 by 4 by the reciprocal method.

Operation $36 \times .25 = 9$ which is the same result as would be obtained by dividing 36 by 4.

Reciprocals greatly facilitate division and are very convenient when several amounts are to be divided by the same number

Reciprocals Frequently Used

Dozen	12	.083333	Bushels		Months	
Gross	144	.0069444	60 Lbs.	.016667	28 Days	.035714
Sq Ft.	144 Sq In.	.0069444	56 Lbs.	.017857	29 Days	.034483
Cu. Ft.	1728 Cu. In.	.0005787	48 Lbs.	.020833	30 Days	.033333
Mile	5280 Ft.	.00018939	32 Lbs.	.03125	31 Days	.032258
Long Ton	2240 Lbs.	.00044643		Years		
Ream	480 Sheets	.0020833	360 Days	.0027778	365 Days	.0027397

When computing reciprocals, they should be carried to sufficient decimal places so that the following rule may be applied when dividing by the reciprocal method:

Use one more digit of the reciprocal, including preceding ciphers, than there are whole digits in the dividend, plus one digit for each decimal place to which it is desired to carry the answer

Decimal Equivalents of Common Fractions

In most machine calculating it is desirable to use the decimal equivalents of common fractions, and in many cases it is necessary to use decimal equivalents.

Decimal equivalents must be used for adding and subtracting unless the machine is equipped with fractional keys, as shown in the accompanying illustration. Fractional machines are available for many uses, such as adding and subtracting feet and inches, hours and minutes, etc. The fractions on fractional machines, however, cannot be used for multiplying and dividing.

1/8 Fractional Keyboard
Fractional keys are used for adding and subtracting only

To multiply common fractions, as 5/8 by 40 or 5/8 by 7/8, and express the result decimally, it is necessary to divide the product of the numerators by the product of the denominators.

To divide common fractions, it is necessary to invert one of the factors and then proceed as in multiplication of common fractions.

Some problems in multiplication and division, involving common fractions, can be handled as explained above, but if the same fractions are to be used frequently, time can be saved by using their decimal equivalents, or in the case of division, by using the reciprocal method.

A common fraction can be changed to its decimal equivalent by dividing the numerator by the denominator

Example To change 5/8 to its decimal equivalent, divide 5 by 8. Answer: .625.

5/8 of 40 = .625 × 40. Answer 25.

40 ÷ 5/8 = 40 ÷ .625. Answer 64.

40 ÷ 5/8 by the reciprocal method = 40 × 1.6. Answer 64.

The decimal equivalents of common fractions most frequently used are given on page 12

TABLES

Below is a partial list of tables that may be obtained from any Burroughs salesman. Each is printed on a separate card.

Reciprocals of numbers.
Decimal equivalents of common fractions.
Decimal equivalents of fractional parts of a gross.
Decimal equivalents of fractional parts of a gross ton.
Decimal equivalents of fractional parts of an hour, fractional parts of a day, and fractional parts of a month.
Months and days expressed in decimal equivalents of a year.
Decimal equivalents of chain discounts.
Constants for computing interest on the basis of 360 days in a year
Constants for computing interest on the basis of 365 days in a year
Table for figuring brokerage interest.
Decimal equivalents of fractional part of a bushel.
Lumber table.
Table for figuring steel beams.
Turnover table.
Mark-up table.

Trade Discount

Trade discounts provide for fluctuations in prices and at the same time enable the manufacturer or dealer to use established list prices as the basis for quotations.

To Find the Amount of the Discount

The amount of discount is found by multiplying the gross amount of the bill by the discount per cent which is always a decimal. The operation may be performed as a simple multiplication from the right of the machine or, if the gross amount is on the dials, the Stroke Wheel Method may be used.

The key factor is held according to the large figures when the amount of the discount is being calculated, since simple multiplication is performed.

Example Find 65% (.65) discount on a gross bill of $425

Operation Multiply $425 by .65 and point off two places. Answer $276.25.

To Find the Net Amount

Follow the Stroke Wheel Method, using the small figures for the discount, but do not deduct one from the key factor, as is usual with Stroke Wheel Multiplication. By using the small figures in this manner, the amount of the discount is subtracted from the gross amount as the calculation is made.

The gross amount is entered at the right of the keyboard and then multiplied by the discount per cent, using the small figures on the key tops. The product will be the net amount. Additional discounts may be deducted in the same manner

Over the left figure

Successive or Chain Discounts

Problem. $18.75 less 65-20-5%

Operation. Place $18.75 on the dials

First—Hold small 65 as shown in the illustration and perform a Stroke Wheel Multiplication. The dials will show $6.5625

Second—Hold small 20 and multiply as before. The dials will show $5.25

Third—Hold small 05 and perform a Stroke Wheel Multiplication. Answer: $4.99

Always hold the discount in small figures as it is written decimally.

When nines occur in the discount, omit them and hold the remaining figures.

Examples For 90, hold small cipher only, for 95, hold small five only, for .09, hold small cipher only; for 19, hold small one.

Point off according to the rule for Multiplication of Decimals.

After finding the net amount of the following items, the accuracy of the work may be checked by adding the several products which should agree with the total answer shown in the problem.

275.00 less	40-10-10%	$133.65
58.75 less	65-20-5%	15.63
6.30 less	33⅓-10-10%	3.40
75 less	95-10-5%	.03
68.95 less	90-10-10%	5.58
	Answer	$158.29

A chain discount may be computed in any order

Example 60-10-5% is the same as 5-10-60%

The net amount may also be found by multiplying the gross amount by the net decimal equivalent. See the table of Net Decimal Equivalents of Chain Discounts on page 32

When using a Net Decimal Equivalent by the Stroke Wheel Method hold one less, using the large figures.

Net Decimal Equivalent Method of Figuring Chain Discounts

When a series or chain of discounts is used frequently, the operation may be shortened by using the net decimal equivalent.

The net decimal equivalent of a series of discounts is the product of their complements.

Example: Find the net amount of $425.00 less 65-20-05%

Discounts .65-.20.-05

Complements: .35 × .80 × 95 = .266, Net Decimal Equivalent.

Operation $425 × 266 = $113.05

Finding Net Decimal Equivalents

The process of finding the Net Decimal Equivalent may be simplified by performing Stroke Wheel Multiplication in the following manner

Example Find the Net Decimal Equivalent of 45-35-20-5%

NOTE: Always hold the key factor so the first right-hand figure will be in the same column as the first left-hand figure of the dial factor.

Use the small figures on the keys.

Operation First —Add 1 in the first column from the right and set a decimal pointer to the right of it.

Second—Hold small 45 and depress the keys once. The dials will show 55

Third —Hold small 35 and depress the keys the number of times indicated by the dials, as in Stroke Wheel Multiplication. The dials will show 3575.

Fourth—Hold small 20 and depress the keys the number of times indicated by the dials, as in Stroke Wheel Multiplication. The dials will show 28600.

Fifth —Hold small 05 and depress the keys the number of times indicated by the dials, as in Stroke Wheel Multiplication. The dials will show 27170000.

Point off as many places from the right as there are decimal places in all the key factors.

The discount 45-35-20-5% equals .45-.35-.20-.05, when expressed decimally The pointer should, therefore, be moved to the left eight places, beginning at the first right-hand dial where it was originally set.

After pointing off, the answer is 2717, which is the Net Decimal Equivalent.

NOTE: Decimal equivalents of discounts should be carried to five decimal places.

Problems for Practice

Find the Net Decimal Equivalents of the discounts in the following problems and then figure the Net Amount of each item

Gross Items		Discounts
$ 73.50	less	.75-.10
127.60	less	25-.10-.10
27.85	less	95-.10-.05
87 50	less	90-.90-.10

In figuring problems involving extensions and discounts, first find the Net Decimal Equivalents of the discounts and note them on paper Clear the machine. Then compute the gross amount and take off the discount by multiplying by the Net Decimal Equivalent, using the large figures on the keys.

When using a Net Decimal Equivalent by the Stroke Wheel Method use the large figures and hold one less.

Find the net amounts for the following items.

985 gross ¾ x 8 screws @ $ 95 gro
Less 70-20-10-5-2½%

1050 gross ¾ x 10 screws @ 1.10 gro
Less 67½-20-10-5-2½%

Prorating

Prorating is the distributing of amounts proportionately

To illustrate the principle, two problems have been selected. In the first, the total earnings are distributed according to the amounts invested.

Problem 1:

Five men invest $6684. The net earnings are $1240.

		Earnings
A Invests	$1500.00	$ 278.28
B Invests	2200.00	.....
C Invests	750.00	.....
D Invests	984.00	.....
E Invests	1250.00	.....
Totals	$6684.00	$1240.00

Find each one's share of the profit.

If $6684, the total investment, earns $1240, the earnings of one dollar may be found by dividing $1240 by $6684. Answer $ .185518.

Since "A's" investment is $1500, his share of the earnings is 1500 × $ 185518 or $278.28.

Earnings on the other investments may be found by multiplying each investment by the earnings of one dollar.

Problem 2:

Four salesmen sold $2923 worth of merchandise.

Salesmen			Per Cent
1	$ 846.00		29
2	1292.00		.....
3	370.00		.....
4	415.00		.....
Total Sales	$2923.00	Total %	100

Find the percentage of each salesman's sales to the total sales.

The percentage of each salesman's sales may be found by dividing his sales by the total sales.

Instead of performing several divisions, the process may be shortened by multiplying each salesman's sales by the ratio percentage of one dollar to the total sales.

The ratio of one dollar to the total sales is found by dividing 1 by 2923 (the total sales). Answer. .0003421 This is the reciprocal of 2923.

The per cent of each salesman's sales may now be found by multiplying his sales in dollars by .0003421

The total per cent should equal one hundred.

NOTE: In actual prorating work the total of the individual items will usually not be exactly 100 per cent (or its equivalent), due to the fact that fractions are not always completely carried out.

Figuring Lumber

Lumber is sold by the board foot, and is usually priced by the thousand feet.

The abbreviation (M) is used for thousand.
(′) is used for feet.
and (″) is used for inches.

A board foot contains 144 cubic inches. Thus a piece of lumber 1″ thick, 12″ wide and 1′ long contains one board foot. Likewise a piece 2″x 6″x 1′ contains one board foot.

Therefore, to figure the number of board feet in a piece of lumber, the following rule may be applied.

Rule: Thickness in inches × width in inches × length in feet ÷ 12 = board feet.

Example How many board feet in a piece of lumber 2″ thick by 6′ wide by 9′ long?

Operation $\frac{2'' \times 6'' \times 9'}{12} = 9$ feet

Multiply by .08333 (the reciprocal of 12) instead of dividing by twelve.

After finding the number of board feet in each piece, multiply this result by the number of pieces to obtain the total board feet.

Example· 16 pieces 2″x 4″x 16′.

Operation $16 \times 2'' \times 4'' \times 16' \div 12 = 171$ board feet.

Find the total board feet in the following problems

1 78 pieces 3″x 8″x 11′
2 36 pieces 4″x 16″x 14′
3 28 pieces 2″x 6″x 20′
4 14 pieces 2″x 6″x 20′

Using the Lumber Table

In using the table on page 29, it is only necessary to multiply the number of pieces by the number of board feet, as shown, in each piece.

Example Find the number of board feet in 35 boards 1″x 8″x 14′.

Operation Locate the size in inches (1 x 8) in the table, and on the same line in the column marked 14, is found 9.33333, the number of board feet in each piece.

35 × 9.33333 = 326.666, or 327 board feet.

Add one board foot for a fraction of one-half or over in the total board feet.

The value may then be found by multiplying the total board feet by the price.

Lumber Table

LENGTH IN FEET

Sizes in Inches	8	10	12	14	16	18	20	22	24	26	Sizes in Inches
1 x 2	1.33333	1.66667	2.	2.33333	2.66667	3.	3.33333	3.66667	4.	4.33333	1 x 2
1 x 3	2.	2.5	3.	3.5	4.	4.5	5.	5.5	6.	6.5	1 x 3
1 x 4	2.66667	3.33333	4.	4.66667	5.33333	6.	6.66667	7.33333	8.	8.66667	1 x 4
1 x 5	3.33333	4.16667	5.	5.83333	6.66667	7.5	8.33333	9.16667	10.	10.83333	1 x 5
1 x 6	4.	5.	6.	7	8.	9.	10.	11.	12.	13.	1 x 6
1 x 8	5.33333	6.66667	8.	9.33333	10.66667	12.	13.33333	14.66667	16.	17.33333	1 x 8
1 x 10	6.66667	8.33333	10.	11.66667	13.33333	15.	16.66667	18.33333	20.	21.66667	1 x 10
1 x 12	8.	10.	12.	14.	16.	18.	20.	22.	24.	26.	1 x 12
1 x 14	9.33333	11.66667	14.	16.33333	18.66667	21.	23.33333	25.66667	28.	30.33333	1 x 14
1 x 16	10.66667	13.33333	16.	18.66667	21.33333	24.	26.66667	29.33333	32.	34.66667	1 x 16
1 x 18	12.	15.	18.	21.	24.	27.	30.	33.	36.	39.	1 x 18
1 x 20	13.33333	16.66667	20.	23.33333	26.66667	30.	33.33333	36.66667	40.	43.33333	1 x 20
1¼ x 4	3.33333	4.16667	5.	5.83333	6.66667	7.5	8.33333	9.16667	10.	10.83333	1¼ x 4
1¼ x 5	4.16667	5.20833	6.25	7.29167	8.33333	9.375	10.41667	11.45833	12.5	13.54167	1¼ x 5
1¼ x 6	5.	6.25	7.5	8.75	10.	11.25	12.5	13.75	15.	16.25	1¼ x 6
1¼ x 8	6.66667	8.33333	10.	11.66667	13.33333	15.	16.66667	18.33333	20.	21.66667	1¼ x 8
1¼ x 10	8.33333	10.41667	12.5	14.58333	16.66667	18.75	20.83333	22.91667	25.	27.08333	1¼ x 10
1¼ x 12	10.	12.5	15.	17.5	20.	22.5	25.	27.5	30.	32.5	1¼ x 12
1½ x 4	4.	5.	6.	7	8.	9.	10.	11.	12.	13.	1½ x 4
1½ x 5	5.	6.25	7.5	8.75	10.	11.25	12.5	13.75	15.	16.25	1½ x 5
1½ x 6	6.	7.5	9.	10.5	12.	13.5	15.	16.5	18.	19.5	1½ x 6
1½ x 8	8.	10.	12.	14.	16.	18.	20.	22.	24.	26.	1½ x 8
1½ x 10	10.	12.5	15.	17.5	20.	22.5	25.	27.5	30.	32.5	1½ x 10
1½ x 12	12.	15.	18.	21.	24.	27	30.	33.	36.	39.	1½ x 12
2 x 4	5.33333	6.66667	8.	9.33333	10.66667	12.	13.33333	14.66667	16.	17.33333	2 x 4
2 x 6	8.	10.	12.	14.	16.	18.	20.	22.	24.	26.	2 x 6
2 x 8	10.66667	13.33333	16.	18.66667	21.33333	24.	26.66667	29.33333	32.	34.66667	2 x 8
2 x 10	13.33333	16.66667	20.	23.33333	26.66667	30.	33.33333	36.66667	40.	43.33333	2 x 10
2 x 12	16.	20.	24.	28.	32.	36.	40.	44.	48.	52.	2 x 12
2 x 14	18.66667	23.33333	28.	32.66667	37.33333	42.	46.66667	51.33333	56.	60.66667	2 x 14
2 x 16	21.33333	26.66667	32.	37.33333	42.66667	48.	53.33333	58.66667	64.	69.33333	2 x 16
2½ x 12	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	2½ x 12
2½ x 14	23.33333	29.16667	35.	40.83333	46.66667	52.5	58.33333	64.16667	70.	75.83333	2½ x 14
2½ x 16	26.66667	33.33333	40.	46.66667	53.33333	60.	66.66667	73.33333	80.	86.66667	2½ x 16
3 x 6	12.	15.	18.	21.	24.	27	30.	33.	36.	39.	3 x 6
3 x 8	16.	20.	24.	28.	32.	36.	40.	44.	48.	52.	3 x 8
3 x 10	20.	25.	30.	35.	40.	45.	50.	55.	60.	65.	3 x 10
3 x 12	24.	30.	36.	42.	48.	54.	60.	66.	72.	78.	3 x 12
3 x 14	28.	35.	42.	49.	56.	63.	70.	77.	84.	91.	3 x 14
3 x 16	32.	40.	48.	56.	64.	72.	80.	88.	96.	104.	3 x 16
4 x 4	10.66667	13.33333	16.	18.66667	21.33333	24.	26.66667	29.33333	32.	34.66667	4 x 4
4 x 6	16.	20.	24.	28.	32.	36.	40.	44.	48.	52.	4 x 6
4 x 8	21.33333	26.66667	32.	37.33333	42.66667	48.	53.33333	58.66667	64.	69.33333	4 x 8
4 x 10	26.66667	33.33333	40.	46.66667	53.33333	60.	66.66667	73.33333	80.	86.66667	4 x 10
4 x 12	32.	40.	48.	56.	64.	72.	80.	88.	96.	104.	4 x 12
4 x 14	37.33333	46.66667	56.	65.33333	74.66667	84.	93.33333	102.66667	112.	121.33333	4 x 14
6 x 6	24.	30.	36.	42.	48.	54.	60.	66.	72.	78.	6 x 6
6 x 8	32.	40.	48.	56.	64.	72.	80.	88.	96.	104.	6 x 8
6 x 10	40.	50.	60.	70.	80.	90.	100.	110.	120.	130.	6 x 10
6 x 12	48.	60.	72.	84.	96.	108.	120.	132.	144.	156.	6 x 12
6 x 14	56.	70.	84.	98.	112.	126.	140.	154.	168.	182.	6 x 14
6 x 16	64.	80.	96.	112.	128.	144.	160.	176.	192.	208.	6 x 16
8 x 8	42.66667	53.33333	64.	74.66667	85.33333	96.	106.66667	117.33333	128.	138.66667	8 x 8
8 x 10	53.33333	66.66667	80.	93.33333	106.66667	120.	133.33333	146.66667	160.	173.33333	8 x 10
8 x 12	64.	80.	96.	112.	128.	144.	160.	176.	192.	208.	8 x 12
8 x 14	74.66667	93.33333	112.	130.66667	149.33333	168.	186.66667	205.33333	224.	242.66667	8 x 14
10 x 10	66.66667	83.33333	100.	116.66667	133.33333	150.	166.66667	183.33333	200.	216.66667	10 x 10
10 x 12	80.	100.	120.	140.	160.	180.	200.	220.	240.	260.	10 x 12
10 x 14	93.33333	116.66667	140.	163.33333	186.66667	210.	233.33333	256.66667	280.	303.33333	10 x 14
10 x 16	106.66667	133.33333	160.	186.66667	213.33333	240.	266.66667	293.33333	320.	346.66667	10 x 16
12 x 12	96.	120.	144.	168.	192.	216.	240.	264.	288.	312.	12 x 12
12 x 14	112.	140.	168.	196.	224.	252.	280.	308.	336.	364.	12 x 14
12 x 16	128.	160.	192.	224.	256.	288.	320.	352.	384.	416.	12 x 16
14 x 14	130.66667	163.33333	196.	228.66667	261.33333	294.	326.66667	359.33333	392.	424.66667	14 x 14
14 x 16	149.33333	186.66667	224.	261.33333	298.66667	336.	373.33333	410.66667	448.	485.33333	14 x 16
Sizes in Inches	8	10	12	14	16	18	20	22	24	26	Sizes in Inches

LENGTH IN FEET

Mark-up Table

Overhead %	NET PROFIT 1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	Overhead %
0	1.0101	1.02041	1.03093	1.04167	1.05263	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	0
1	1.02041	1.03093	1.04167	1.05263	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1
2	1.03093	1.04167	1.05263	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	2
3	1.04167	1.05263	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	3
4	1.05263	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	4
5	1.06383	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	5
6	1.07527	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	6
7	1.08696	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	7
8	1.0989	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	8
9	1.11111	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	9
10	1.1236	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	10
11	1.13636	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	11
12	1.14943	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	12
13	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	13
14	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	14
15	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	15
16	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	16
17	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	17
18	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	18
19	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	19
20	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	20
21	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	21
22	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	22
23	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	23
24	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	24
25	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	25
26	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	26
27	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	27
28	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	28
29	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	29
30	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	30
31	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	31
32	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	32
33	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	33
34	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	34
35	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	35
36	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	36
37	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	37
38	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	38
39	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	39
40	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	40
41	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	41
42	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	42
43	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	43
44	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	44
45	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	45
46	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	46
47	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	47
48	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	48
49	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	49
50	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	50
Overhead %	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	Overhead %

In marking goods, two factors must be considered:

1st The per cent of overhead (cost of doing business).

2d The per cent of net profit.

In the above table the per cent of net profit and overhead have been figured on the selling price. The selling price of goods that cost one dollar is found in the net profit column on a line with the required per cent of overhead.

Mark-up Table

Overhead %	NET PROFIT 14%	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	26%	Overhead %
0	1.16279	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	0
1	1.17647	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1
2	1.19048	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	2
3	1.20482	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	3
4	1.21951	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	4
5	1.23457	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	5
6	1.25	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	6
7	1.26582	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	7
8	1.28205	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	8
9	1.2987	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	9
10	1.31579	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	10
11	1.33333	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	11
12	1.35135	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	12
13	1.36986	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	13
14	1.38889	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	14
15	1.40845	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	15
16	1.42857	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	16
17	1.44928	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	17
18	1.47059	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	18
19	1.49254	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	19
20	1.51515	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	20
21	1.53846	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	21
22	1.5625	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	22
23	1.5873	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	23
24	1.6129	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	24
25	1.63934	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	25
26	1.66667	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	26
27	1.69492	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	27
28	1.72414	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	28
29	1.75439	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	29
30	1.78571	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	30
31	1.81818	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	31
32	1.85185	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	32
33	1.88679	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	33
34	1.92308	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	34
35	1.96078	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	35
36	2.	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	36
37	2.04082	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	37
38	2.08333	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	38
39	2.12766	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	39
40	2.17391	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	40
41	2.22222	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	41
42	2.27273	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	42
43	2.32558	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	43
44	2.38095	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	44
45	2.43902	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	45
46	2.5	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	3.57143	46
47	2.5641	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	3.57143	3.7037	47
48	2.63158	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	3.57143	3.7037	3.84615	48
49	2.7027	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	3.57143	3.7037	3.84615	4.	49
50	2.77778	2.85714	2.94118	3.0303	3.125	3.22581	3.33333	3.44828	3.57143	3.7037	3.84615	4.	4.16667	50
Overhead %	14%	15%	16%	17%	18%	19%	20%	21%	22%	23%	24%	25%	26%	Overhead %

The selling price of an article can be found by multiplying the cost by the amount shown in the column that represents the selling price for one dollar at the desired mark-up.

Example: If the overhead is 30 per cent and the desired net profit is 6 per cent, the selling price of an article that cost $3.75 is found by multiplying 3.75 by 1.5625. Answer, $5.86.

To prove the operation, deduct 36 per cent from $5.86 as in trade discount.

Table of Net Decimal Equivalents of Chain Discounts

The net equivalent of a chain discount is the same regardless of the sequence of the separate discounts. For instance, 60-10-5% is the same as 10-5-60%.

In discounting amounts of less than $10, it is not necessary to use more than four figures of the decimal equivalent.

Rate %	5	7½	10	12½	15	16⅔	20	25	30	33⅓	35	37½
Net	.95	.925	.90	.875	.85	.83333	.80	.75	.70	.66667	.65	.625
2½	.92625	.90188	.8775	.85313	.82875	.8125	.78	.73125	.6825	.65	.63375	.60938
5	.9025	.87875	.855	.83125	.8075	.79166	.76	.7125	.665	.63333	.6175	.59375
5 2½	.87994	.85678	.83363	.81047	.78731	.77187	.741	.69469	.64838	.6175	.60206	.57891
5 5	.85738	.83481	.81225	.78969	.76713	.75208	.722	.67688	.63175	.60167	.58663	.56406
5 5 2½	.83594	.81394	.79194	.76995	.74795	.73328	.70395	.65995	.61596	.58663	.57196	.54996
7½	.87875	.85563	.8325	.80938	.78625	.77083	.74	.69375	.6475	.61667	.60125	.57813
7½ 2½	.85678	.83423	.81169	.78914	.76659	.75156	.7215	.67641	.63131	.60125	.58622	.56367
7½ 5	.83481	.81284	.79088	.76891	.74694	.73229	.703	.65906	.61513	.58583	.57119	.54922
10	.855	.8325	.81	.7875	.765	.75	.72	.675	.63	.6	.585	.5625
10 2½	.83363	.81169	.78975	.76781	.74588	.73125	.702	.65813	.61425	.585	.57038	.54844
10 5	.81225	.79088	.7695	.74813	.72675	.7125	.684	.64125	.5985	.57	.55575	.53438
10 5 2½	.79194	7711	.75026	.72942	.70858	.69469	.6669	.62522	.58354	.55575	.54186	.52102
10 7½	.79088	.77006	.74925	.72844	.70763	.69375	.666	.62438	.58275	.555	.54113	.52031
10 10	.7695	.74925	.729	.70875	.6885	.675	.648	.6075	.567	.54	.5265	.50625
10 10 5	.73103	71179	.69255	.67331	.65408	.64125	.6156	.57713	.53865	.513	.50018	.48094
10 10 5 2½	71275	.69399	.67524	.65648	.63772	.62522	.60021	.5627	.52518	.50018	.48767	.46891
Rate %	**40**	**50**	**60**	**62½**	**65**	**66⅔**	**70**	**75**	**80**	**85**	**87½**	**90**
Net	60	.50	.40	.375	.35	.33333	.30	.25	.20	.15	.125	.10
2½	.585	.4875	.39	.36563	.34125	.325	.2925	.24375	.195	.14625	.12188	.0975
5	.57	.475	.38	.35625	.3325	.31667	.285	.2375	.19	.1425	.11875	.095
5 2½	.55575	.46313	.3705	.34734	.32419	.30875	.27788	.23156	.18525	.13894	.11578	.09263
5 5	.5415	.45125	.361	.33844	.31588	.30083	.27075	.22563	.1805	.13538	.11281	.09025
5 5 2½	.52796	.43997	.35198	.32998	.30798	.29331	.26398	.21998	.17599	.13199	.10999	.08799
7½	.555	.4625	.37	.34688	.32375	.30833	.2775	.23125	.185	.13875	.11563	.0925
7½ 2½	.54113	.45094	.36075	.3382	.31566	.30063	.27056	.22547	.18038	.13528	.11273	.09019
7½ 5	.52725	.43938	.3515	.32953	.30756	.29292	.26363	.21969	.17575	.13181	.10984	.08788
10	.54	.45	.36	.3375	.315	.3	.27	.225	.18	.135	.1125	.09
10 2½	.5265	.43875	.351	.32906	.30713	.2925	.26325	.21938	.1755	.13163	.10969	.08775
10 5	.513	.4275	.342	.32063	.29925	.285	.2565	.21375	.171	.12825	.10688	.0855
10 5 2½	.50018	.41681	.33345	.31261	.29177	.27788	.25009	.20841	.16673	.12504	.1042	.08336
10 7½	.4995	.41625	.333	.31219	.29138	.2775	.24975	.20813	.1665	.12488	.10406	.08325
10 10	.486	.405	.324	.30375	.2835	.27	.243	.2025	.162	.1215	.10125	.081
10 10 5	.4617	.38475	.3078	.28856	.26933	.2565	.23085	.19238	.1539	.11543	.09619	.07695
10 10 5 2½	45016	.37513	.30011	.28135	.26259	.25009	.22508	.18757	.15005	.11254	.09378	.07503

Decimal equivalents not shown in this table may be found as follows

Rule—Multiply the complements of the discounts. The product will be their net decimal equivalent.

Example Find the net decimal equivalent for 45-20-10%.

Discounts · .45— 20—.10

Complements $55 \times .80 \times 90 = .396$, Net Decimal Equivalent.

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